BEACON HR/PAYROLL IMPLEMENTATION PROJECT
REPORTING STRATEGY

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1. EXECUTIVE SUMMARY

The project to implement SAP ERP 2005 for Human Resources and Payroll will require a reporting solution that will effectively support the HR and Payroll business processes and also provide the ability to perform analysis of those core business processes. The State of North Carolina has selected the SAP Netweaver Business Intelligence (SAP BI) solution to meet these reporting and analytical needs.

Implementing SAP BI requires an agreed and consistent approach for satisfying these reporting and analysis requirements within the framework of the State's overall IT strategy.

This document identifies the various reporting tools that are provided out-of-the-box by the SAP applications, and will include a recommendation as to the deployment and usage of each of these tools. As such this discussion document addresses the following questions:

- What reporting tools are available within ERP 2005 and SAP BI?
- Which reporting tools will be implemented by the project, including third party tools?
- What areas and information will the SAP BI furnish?

The guidelines presented in this document will direct the approach to the Blueprint phase and the scope of development during the realization phase. Additionally, the tool selection, and subsequently the technology deployed, will have a direct correlation to the post implementation team's skill set requirements.

Generally speaking, due to the enhanced reporting features, functionality and performance, the SAP BI will be the intended reporting solution, technology and system. In the cases where specific transactional details are not available within SAP BI, or the timeliness of the data dictates that the report must be executed in a real-time manner, an ERP 2005 solution (standard ERP 2005 transaction/report, or custom code) will be used in order to satisfy the reporting requirement. In cases where pixel formatted reporting (exact position of each field is critical such as CAFR or balance sheets) is required, Crystal Reports will be the preferred solution.

This Reporting Strategy should be considered as a living document subject to change as more is learnt about the reporting and analysis needs of the State.

2. AUDIENCE

This document is intended to communicate the approach to reporting to other team members, stakeholders and State of North Carolina Information Technology Services (ITS) management. A basic knowledge of both ERP 2005 and SAP BI is assumed.

3. REPORTING CONCEPTS AND PRINCIPLES

The Reporting Strategy is driven by basic reporting principles. These principles are formulated by cross-industry experience in data warehousing implementations; best-practice recommendations from SAP and BearingPoint; and strategic discussions between the BI team lead, Development team lead, Technical team lead and ITS.

3.1. Single-Source of Reports

Individual reports produced out of the system landscape will be presented from a single source (ERP 2005 or SAP BI). Multiple versions or sources of the same or similar reports (shadow reporting systems) can result in different assumptions, processes, calculations, and subsequent conclusions. This leads to confusion when information cannot be reconciled, creates complications from a support perspective, and often requires unnecessary development. The SAP BI will be the "single source of the truth" for the majority of reporting requirements.

3.2. Granular-level of detail available for requested reporting requirements

While many reports will be analyzed at an aggregated level, supporting 'document level' detail of these aggregated figures will be available whenever feasible. In terms of SAP BI, this implies both drill-down to more granular data within the system and/or restricted drill-through to ERP 2005 functionality.

3.3. Small technology footprint

A limited toolset will be used for report creation and presentation. This defines the user training and development expertise required and establishes a consistent approach to reporting. With fewer systems and a consistent approach to reporting, a more effective and efficient support procedure will result and system performance can be readily optimized.

3.4. Business-centered focus

Reports will be developed that meet business needs efficiently, cost-effectively and minimize the impact on system performance. A business focus ensures adoption of the system by the user community and will lead to more widespread acceptance of the solution. Reports will be organized into functional areas and designed based on the functional roles performed within the agencies. This enables quick and easy access to the reports necessary to execute, support and analyze the core business processes.

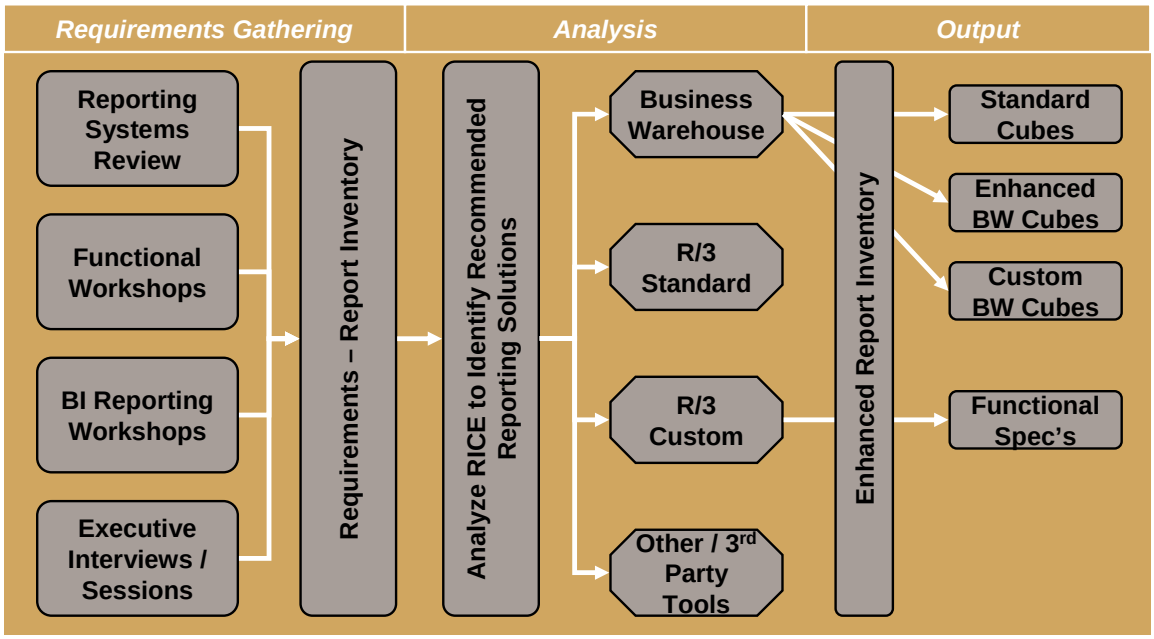
3.5. Integration with Authorizations, Roles, and Personalization

Reports made available within application suite will follow the SAP framework for user authorizations, role assignment, and personalization options. These considerations allow for effective deployment of the SAP Enterprise Portal, whereby users, based upon position/role, will have access to only those reports that they have authority to execute.

4. BLUEPRINT APPROACH

During the Blueprint phase of the project, reporting and analysis requirements are collected and analyzed so that a technical solution can be defined. This process can be broken down into 3 major steps

- Requirements Gathering
- Requirements Analysis
- Solution Definition



Each of these steps will be described in more detail in the following sections.

4.1. Requirements Gathering

The key objective of this step is to identify the business critical reporting that is required to support the HR / PY business processes in scope for BEACON along with management reporting to provide analysis of the processes.

4.1.1. Reporting Systems Review

This process is intended to identify the existing reporting architecture with emphasis on the following

- Reporting / DWH Systems replaced by SAP BI
  - Current reporting needs
  - Current analytical needs

- What is the data warehouse or other tool involved
- Current user base

- Systems not replaced by BW
  - Data warehouse / analytical tools
  - Integration / migration to ERP 2005 / SAP BI
- Develop strategy for implementation of BW within existing reporting environment.

4.1.2. Functional Workshops

An integral part of the Blueprint process is for the functional team to identify and define the core HR / PY business processes to be implemented as part of the BEACON project. This is performed through a number of functional workshops, each one concentrating on the details of a particular functional area and process. A key part of this discovery process is to capture any business critical reports that are required to perform each business process.

- Identify Operational / Transactional Reporting Needs
- Support Business Processes
- Inputs:
  - SME Knowledge
  - Legacy reports

4.1.3. BI Reporting Workshops

The functional workshops concentrate on the business processes and the reporting to support these. It is therefore necessary to also hold additional workshops to address the reporting to manage and analyze these business processes. These BI reporting workshops are designed to

- Identify Management / Analysis Reports
- Concentrate on analysis of operations and reporting
- Identify Analytical Processes
- Opportunity to capture missed process reporting
- Inputs:
  - SME Knowledge
  - Existing analytical systems

4.1.4. Executive Interviews / Sessions

The blueprint workshops for business process and management reporting will provide the basis of the BI requirements for operational, tactical and management reports. However there will also be a need to provide strategic level reporting for State executives and leaders. Although these reports are not 'business process critical' they will become more important following the initial go-live of the HR / PY system. It is therefore important that the future needs for strategic reporting are considered during the initial reporting system

design. These requirements are usually dashboard or scorecard reports for higher level Key Performance Indicators (KPI).

- Targeted Interviews with key executives / sponsors
- Concentrate on performance metrics
- Identify / Confirm KPIs

These sessions also provide an excellent opportunity to obtain executive buy in and input.

4.2. Requirements Analysis

The output of the requirements gathering will be a list of reports (Report Inventory) collected during the workshops and interviews. Following an initial consolidation and prioritization of these requirements each report will be assessed to decide which reporting system will be used. The guidelines in section 5.1 will be followed in this initial assessment.

Further analysis will be performed to develop an Information Data Model design to support the reporting and analytical needs of BEACON.

4.2.1. Identify Data Elements required to meet requirements

Each report will be broken down into the data elements that make up the report to generate a list of data required in the reporting solution. These elements need to be normalized across reports to ensure the same terminology is used throughout. Where multiple terms are used to describe the same data element a single definition will be developed to be used across the enterprise.

The main result of this activity is a consolidated glossary of data elements along with descriptions.

4.2.2. Breakdown into basic data elements

Within this glossary of data elements there will be calculated fields that will require breaking down into their basic data elements. For example 'Average Salary' is calculated from 'Total Salary' and 'Total Employees'. It is therefore important that the base elements Salary and Employee are contained within the model.

4.2.3. Consolidate and align data elements – provide enterprise wide definition

It is important to develop a consolidated view of the calculated data fields so that the enterprise has a single definition. For example the definition of Full Time Equivalent (FTE) is usually based on 40 hours; however some areas consider 20+ hrs to be an FTE whilst other areas use a different working week. A single agreed definition of such terms is necessary to ensure enterprise wide understanding. It should be noted that new data fields can be defined based on these differing definitions, i.e. FTE, FTE20 …

The output from the last two steps will be an updated glossary of data elements including details regarding calculations and containing enterprise wide definitions of terms.

4.2.4. Compare data elements against Business Content

Once the data elements required for reporting have been identified the next step is to determine which of the BI business content best meets the reporting needs. First the individual data elements need to be mapped to the data elements (InfoObjects) that make up the data models in SAP BI. Next these are mapped on a report by report basis to business content InfoProviders (DataStore Objects, InfoCubes, etc.). In some cases a report

will require data elements from more than one InfoProvider which will then lead to identification of a custom MultiProvider.

4.2.5. Identify Gaps in Business Content

The comparison process will highlight situations where the delivered business content does not fully meet the identified reporting needs. These requirements need to be carefully reviewed for validity within the context of the business processes supported by the ERP 2005 solution before proposing enhancements or modifications. Once the requirement is verified as a legitimate reporting need there will be additional development of the data model beyond the standard business content.

4.3. Solution Definition

The final selection of which tool will be used to build the report will follow the guidelines in section 5.2 based on the following criteria

- Report Audience
- Report Category
- Report Type.

5. REPORTING TOOL DETERMINATION

The reporting principles outlined in section one highlight the need to minimize the number of reporting systems. Based on the fact that detailed, real-time reporting is required alongside analytical, summarized reporting, it will be necessary to use both ERP 2005 and SAP BI. This therefore requires a two-part process for selection of a reporting tool to meet each reporting need. The first part is the selection of reporting source used, ERP 2005 or SAP BI, and secondly, which reporting tool within the selected system.

This section describes the decision process for selecting the reporting tool for a given requirement.

5.1. Reporting System Determination

5.1.1. Factors affecting choice of reporting system

The reporting system, ERP 2005 or SAP BI, used to fulfill a particular requirement will depend on the following factors:

5.1.1.1. The timeliness of the report's information

If a report requires real-time access to information (such as 'list of employees clocked in'), it would be best suited for ERP 2005. The frequency of data loads into SAP BI will depend on the business case requirement. While the SAP BI extracts can occur frequently, they will not be real-time.

5.1.1.2. The level of detail required for the report

Reports run out of SAP BI typically represent summarizations of individual transactions and documents with drill-down capability into the detail. The level of detail will depend upon the business-reporting requirement.

5.1.1.3. Standard Business Content available in SAP BI

Enhancing the standard Business Content delivered with SAP BI, to include the unique data elements of the State of North Carolina, can satisfy most reporting requirements. These enhancements are global in nature, and can be reused throughout the SAP BI environment. SAP BI should therefore be the first option to fulfill reporting needs. This approach will reduce the workload on the ERP 2005 system.

5.1.1.4. Standard reports available in ERP 2005

Standard ERP 2005 reports are available for the real time and detailed transactional reporting needs of the business. In some cases, however, the standard reports require enhancement. These enhancements are localized and not re-useable for other reporting needs and generally require ABAP coding. However, based upon the enhanced features and functionality within the SAP BI application, if a similar report can be made available in SAP BI, then SAP BI should be the first candidate to fulfill the requirement.

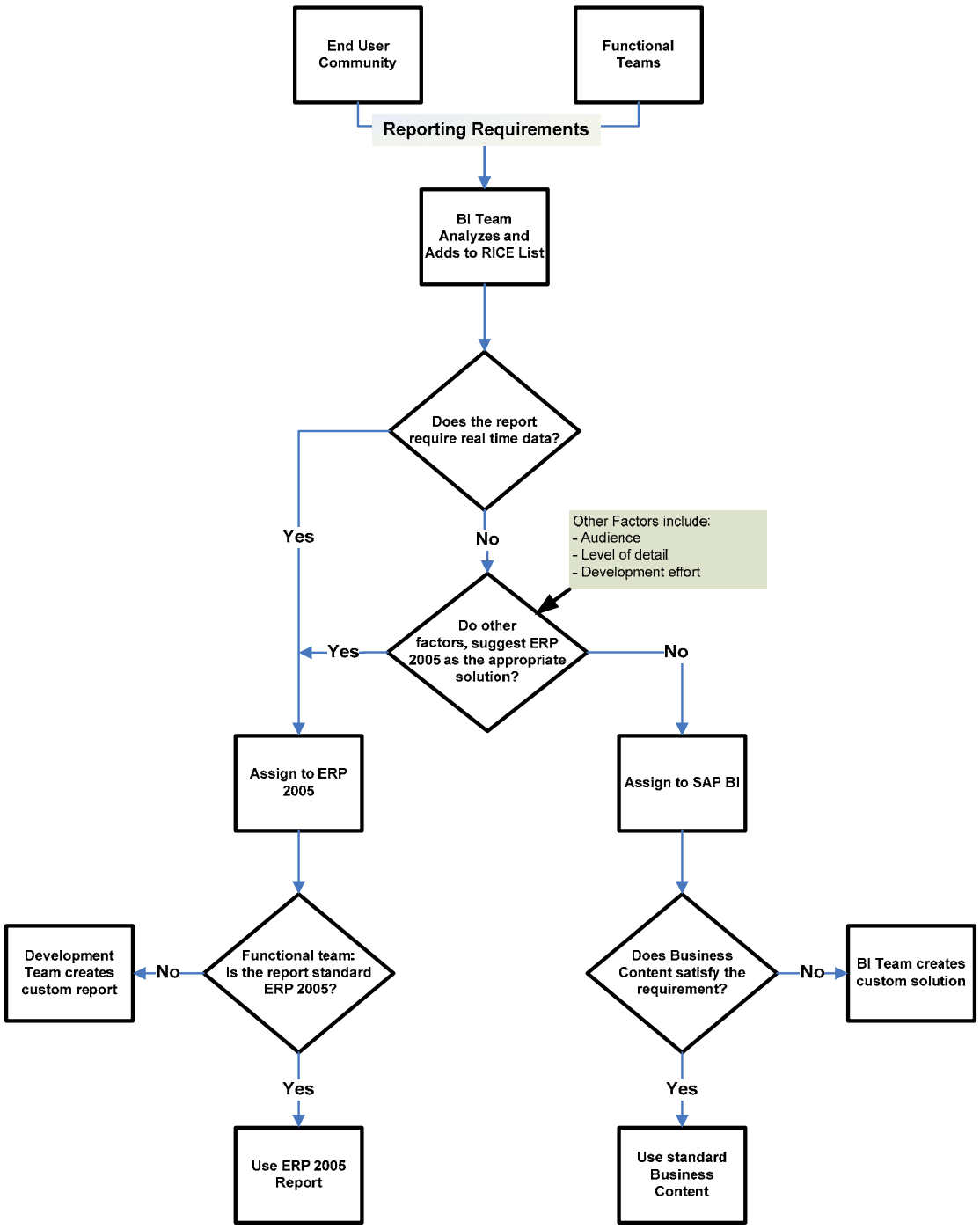
5.1.1.5. The development effort

If the effort to develop a particular report in SAP BI is substantial because there is no readily available Business Content, an evaluation of other SAP reporting tools to provide the required report will be performed.

5.1.2. Selection of Reporting System

The following flowchart will assist with the determination of reporting system used to satisfy a reporting requirement. This is based on the factors described above and assigns the report to either SAP BI, ERP 2005 Standard or ERP 2005 Custom.

Reporting System Selection



5.2. Reporting Tool Determination

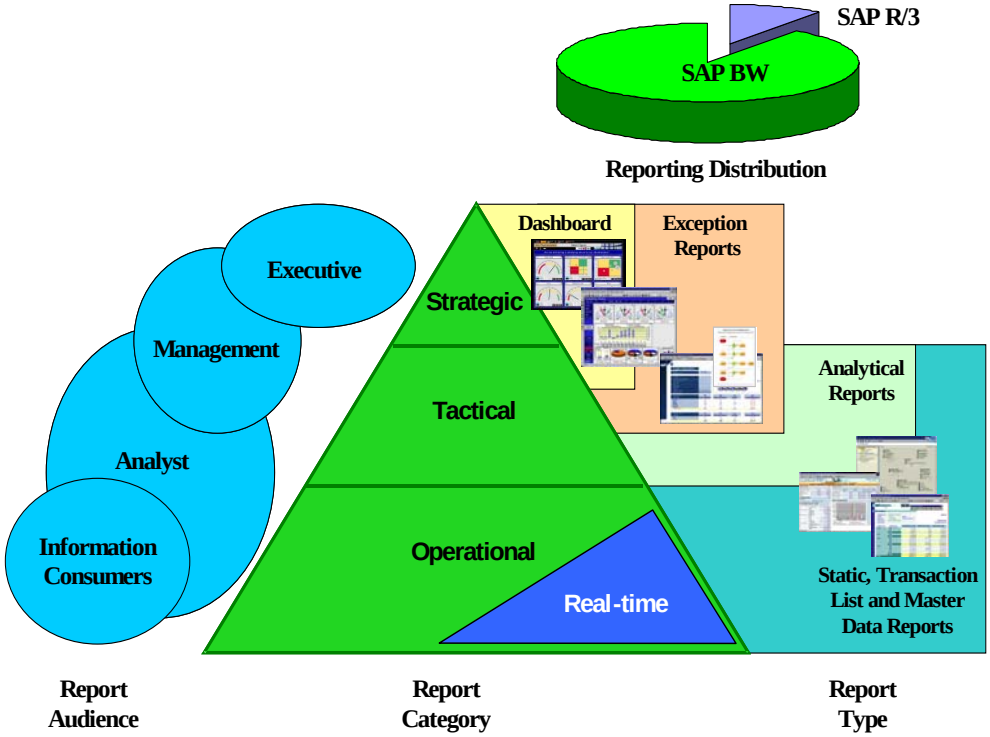
ERP 2005 and SAP BI offer many different toolsets for satisfying report requirements. While preparing the recommendations for BEACON, each of these different toolsets and options were reviewed. A general overview of the relevant tools is available in Section 9.

5.2.1. Factors affecting choice of reporting tool.

There are 3 major factors that affect the selection of reporting tools:

- report audience,
- report type and
- report category.

The following chart summarizes the relationship between these factors and the resulting distribution of reports between the SAP systems (ERP 2005 and SAP BI). Each of these factors will be discussed in the following sections.



5.2.1.1. Report Audience

A user's reporting role within BEACON can influence the selection of the reporting tool used to deliver the report.

In general, information consumers typically require detail-driven or real-time operational reports primarily from ERP 2005. Executives and Management will require strategic and tactical reporting primarily from SAP BI. Analysts, as a group span across all types of reporting and will primarily use SAP BI supplemented with ERP 2005 reports.

User Category	Description
Executives	This includes the executives who view information at a Key Performance Indicator (KPI) level to review the health of the organization against targets. Typical behavior includes viewing trend or summary reports based on exceptions where the KPI suggest larger than expected variances.
Management	This category includes the management team that is responsible for certain departments or business functions. They typically review summarized information as a trend or variance from plan or budgets.
Analyst	These are individuals or teams that analyze information to determine anomalies or to explain the factors contributing to a specific situation. They start with review information at a summarized level, trends or variances, then drilling down to lower levels of details.
Consumers	This includes other interested members of the organization that do not fall into one of the categories mentioned above. These users would typically view information through parameter driven published reports, also referred to as managed reports.

5.2.1.2. Report Category

Reports can be categorized in many ways but for the purposes of this strategy a simple view will be taken that can be readily applied. There are three main report categories that represent the spectrum of reporting needs.

Report Category	Description	Examples
Strategic	Snapshot view of the organization's performance and health. Typically rendered as a benchmark or a KPI dashboard.	Balanced Scorecard, Revenue v/s target, Headcount
Tactical	All information needs of the organization where latency has minimal impact on the desired results, while supporting analysis of historical data utilizing trending, version and time-based comparisons. These can typically be slotted into two key categories - – Analytics, with trend and comparative analysis – Managed, with formatted reporting to support statutory, legal and other submissions.	Plan v/s Actual Costs Overtime cost trends Average annual salary analysis
Operational	Detailed and real-time information to support day-to-day operations of the organization. The key characteristics are - – in support of operational activities, – current time period / no history , – transactional detail and – potentially real-time.	Available budget Employee list Timesheets for approval

5.2.1.3. Report Type

The type of reports can span across the data categories that they report on. This combination will affect which reporting tool / solution is used to present the information to the end user. The following table details the report types considered in this strategy.

Report Type	Description
Dashboard	A collection of metrics and KPIs usually with graphic representation that provide an 'at a glance' view of the organizations performance.
Managed Reports	Reports designed to answer one or more specific business questions. These reports are used to manage, monitor or execute the business on a regular basis, hence are used frequently. These typically are not built to provide the user ability to explore further.

Report Type	Description
Analysis	These are reports that support the transformation of information into organized dimensional or normalized subject areas for slice and dice analytics. It is typical for them to be supported by an On-Line Analytical Processor (OLAP) tool to perform complex analytics.
Exception Reports	Exception alerting is the process of injecting business intelligence to provide exception reports that users can subscribe to and they will be informed when an exception occurs. This is typically supported by a managed report.
Pixel Formatted Reporting	A report with a formatted layout. Additionally formatted reporting is used when it is critical that the placement of fields, graphics, lines and boxes follow a pre-defined format.
Output Forms	The form defines the text format and page layout of documents for display on the screen or for output to a printer. Usually these are specific output forms such as invoices, purchase orders etc.
Ad-hoc Reporting	These are reports that are not required on a regular basis, hence are created on an as-needed basis. Query tools that support data retrieval, summation, aggregation, collation, transformation and other standard capabilities are used to support this function.

5.2.2. SAP BI Reporting Toolset Recommendations

The following ERP 2005 and SAP BI toolsets are recommended for supporting BEACON reporting requirements

5.2.2.1. SAP BI Business Explorer (Bex) Analyzer

The BI Support Organization and Report Writers define queries and workbooks using the Business Explorer Analyzer. This is available in both web based and excel versions. End-users can manipulate these reports and save in their own personal 'favorites'. Queries available for global access will be published into a 'role' that can be tightly controlled by the BI and Netweaver teams.

5.2.2.2. SAP BI Web Application Designer (WAD)

Used exclusively by BI Support Organization to develop and present web-based analytical solutions. This will also be used to develop dashboards. Queries are first developed using the Bex Analyzer and formatted into a web-based application using this tool.

5.2.2.3. SAP BI Reporting Agent (BW 3.5)

The reporting agent is a tool used to schedule reporting functions in the background. The following functions are available: evaluating exceptions, printing queries, pre-calculating web templates. This tool is used to provide exception reports based on pre-defined queries and populate the alert monitor for use on the web.

5.2.2.4. Third Party Systems (Crystal Reporting)

It is understood that the standard SAP BI reporting tools may not fully satisfy all SAP BI reporting requirements. For pixel-based formatting requirements, Crystal Reports is a highly integrated product that has been selected by BEACON. Given the limited scope of requirements, 20 developer licenses have been acquired.

5.2.3. ERP 2005 Toolset Recommendations

5.2.3.1. ABAP List Viewer (ALV)

The ABAP List Viewer will be used within each of its application areas as needed. This assists with the presentation and functionality associated with operational reporting out of ERP 2005. The ALV is very simple to add to custom code, through the use of standard function modules. These function modules provide the user the ability to sort, add total or subtotals, rearrange/reorder columns, hide rows or columns, etc.

5.2.3.2. Logistics Information System (LIS)

The Logistics Information System (LIS) should only be used in the MM-Inventory Controlling application. This area within LIS is unique, because it provides the only real-time report of inventory across a plant. Other LIS applications (aggregated reporting of transactions) are better suited for SAP BI.

5.2.3.3. Report Painter and Report Writer

Report Painter and Report Writer development should only be carried out for reports that require real-time access to Profit Centre Accounting (PCA), Cost Centre Accounting (CCA), or Controlling and Profitability Analysis (COPA) data. Otherwise, SAP BI will be the primary reporting tool for these Controlling (CO) modules. If warranted by business reporting requirements, users will access Report Painter/Writer reports through Report Trees organized by the particular process or role.

SAP BI will be the preferred delivery method for all CO reporting, and only during closing activities will reporting directly from CO on ERP 2005 be necessary and recommended.

5.2.3.4. Custom ABAP

Custom ABAP reports may initially be created using the ABAP Query infosets and queries. The primary benefit surrounding ABAP Query is its openness to external reporting tools.

If these reports prove inefficient or unable to provide the report output required, they will become candidates for pure ABAP code development.

5.2.4. Reporting Solution Matrix

The selection of a tool for reporting is based on the above factors and considerations and is summarized in the table below.

User Category	Report Category	Report Type	System	Tool
Executives	Strategic	Dashboard	SAP BI	Web Application Designer (WAD)

User Category	Report Category	Report Type	System	Tool
				Crystal
		Exception Reports	SAP BI	Reporting Agent & WAD
Management	Strategic	Dashboard	SAP BI	WAD
				Crystal
		Exception Reports	SAP BI	WAD
	Tactical	Managed Reports	SAP BI	WAD
		Exception Reports	SAP BI	WAD
Analyst	Tactical	Analysis	SAP BI	Bex (Excel)
				WAD
		Managed Reports	SAP BI	Bex (Web)
				WAD
		Ad-hoc Reporting	SAP BI	WAD
		Exception Reports	SAP BI	WAD
	Operational	Managed Reports	SAP ERP 2005	Standard Reports
				ABAP Query
				Custom ABAP Report
Information Consumers	Operational	Managed Reports	SAP ERP 2005	Standard Reports
				ABAP Query
				Custom ABAP Report
			SAP BI	WAD
				Bex (Web)

6. HISTORICAL REPORTING OF LEGACY DATA

The current HR system contains approximately 30 years of employment history for the State. Access to and reporting of this data presents a unique challenge to the BEACON project. The current project scope is to load into ERP 2005 only that data that is necessary to be able to support the business processes of ERP 2005. A solution is therefore required such that the additional historical data is available for reporting.

When defining an approach to accommodate historical data the following technical considerations need to be considered.

6.1. Active Data Only vs. All Data

Loading of historical data for currently active employees only can significantly reduce the volume of data. In addition since the employees are still active then the master data to support further transaction processing in ERP 2005 will have been loaded and be available to SAP BI. This will reduce significantly the conversion effort required.

Historical data for inactive employees will require additional effort as the master data for these employees will not be available in the ERP 2005 system. Loading of this data will require the generation of master data codes that do not overlap with the newly assigned codes in the ERP 2005 system.

6.2. Convert 'Old' to 'New'

The ERP 2005 system has a flexible enterprise data model which is used to model business processes and their organizational structures. These data structures will not likely map one to one with the current data structures within the HR and payroll systems. As a consequence there is no guarantee that historical data can be converted into the new structures without some loss of detail. Reporting on combined data (historical and ERP 2005) therefore tends to be at a summarized level.

Careful consideration needs to given before deciding to convert significant amounts of historical data.

6.3. On Line vs. Near Online vs. Archived Storage

The frequency with which the historical data is accessed will dictate whether it will be possible to archive data and reduce the load on the on-line system. Also the need to provide 'combined' reporting will affect how much (if any) of the archived data is converted. Near online Storage is an alternative to online storage with the advantage of cost savings that the archived storage is providing.

6.4. Impact on BEACON

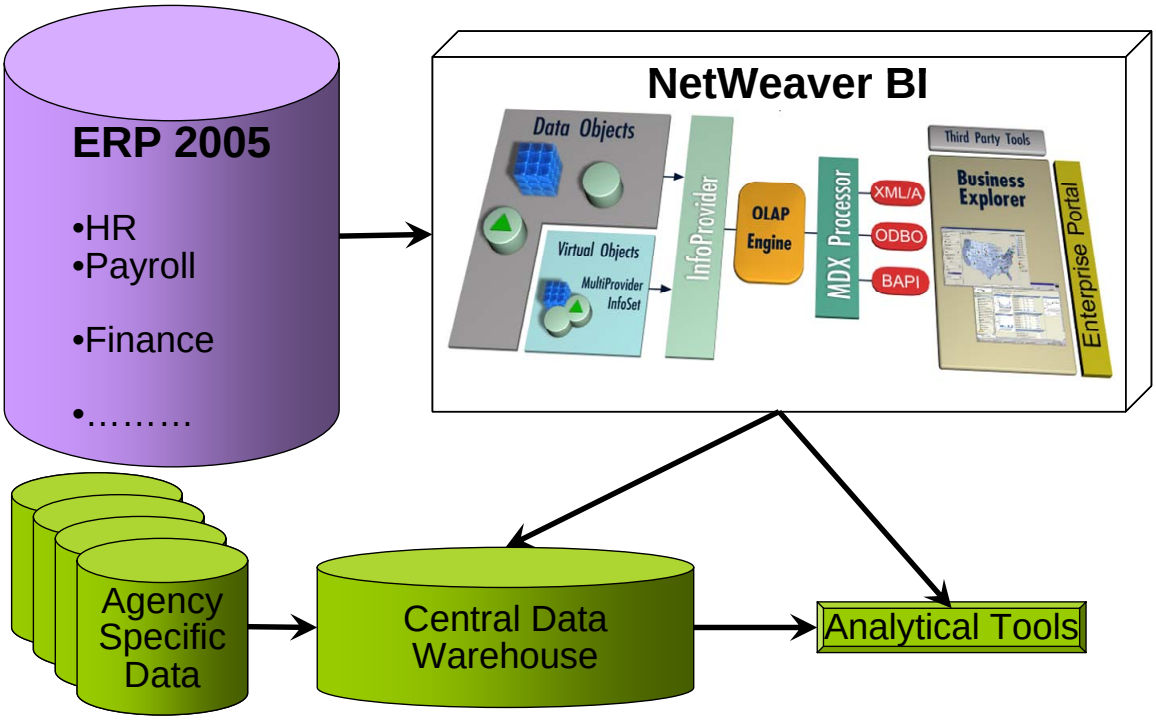
The current scope of BEACON does not include for additional historical data to be loaded into the SAP BI. Also at this stage of the project, detailed requirements for reporting historical data are not known and will be developed as part of the Blueprint process. At a minimum it is expected that combined employment history for active employees (including salaries) will be required. Historical payroll data will likely not be required.

7. INTEGRATION WITH NC STATE ENTERPRISE DATA WAREHOUSE

The State of North Carolina has selected the SAS suite of Applications as the preferred technology to support an Enterprise Data Warehouse solution (EDW). This solution will be hosted by the State Information and Technology Services.

The SAP BI solution also has significant capabilities for providing an Enterprise Data Warehouse solution. However the primary role of SAP's solution will be to provide reporting and analytical support for those core business processes that are performed through the ERP 2005 transactional system. Agency specific business information will not be supported by the ERP 2005 solution and will therefore not be available for reporting in the SAP BI system. The SAP BI solution will primarily contain data extracted from the ERP 2005 system and sufficient non-SAP data to support reporting and analysis of the Core HR/Payroll business processes.

The proposed data flow between the SAP Suite and the SAS suite of products is indicated in the following diagram.



7.1. BEACON Integration with SAS EDW

The SAP BI solution is delivered with pre-defined extractors that are designed to support the reporting and analysis of transactional data from the ERP 2005 system. These extractors provide all the necessary business rules to ensure the consistent and accurate representation of the core business process data within the SAP BI system. The pre-configured solution and structure of the master data within SAP BI ensures conformed dimensions, a pre-requisite for EDW solutions.

7.1.1. SAP BI Open Hub Destination

The SAP BI solution provides the capability to distribute data through the Open Hub Destination to non-SAP data marts, analytical applications and other applications. It ensures a controlled distribution across several systems. This will provide the source operational data to the SAS EDW.

7.1.2. SAP BI Open Analysis Interfaces

In addition to the Open Hub Destination, SAP BI supports direct read access through industry standard OLE DB for OLAP (ODBO), OLAP BAPI and XML/A connections. This will allow the SAS presentation layer to report data directly from SAP BI without the need to stage the data in the EDW first.

7.2. Current SAS Initiatives

North Carolina has already implemented analytical applications using the SAS Suite of products. These were primarily Agency driven projects to meet a specific reporting need.

These projects have enabled the organization to become familiar with the tools and to verify the feasibility of SAS as a solution. The following table gives an example of some of these applications. Use of the Enterprise License Agreement (ELA) for SAS is indicated.

Agency	System	Status (Jan 2006)	ELA Usage
OSC	Statewide Financial DW (NCAS)	Planning	Yes
OSP	Workforce Planning Prototype	Complete	Yes
DHHS	DMA, CSDW	Complete	Yes
ITS	IT Resource Management	Complete	Yes
DOA	Spend Analysis	Prototype Complete	Yes
Budget	Performance Based Budgeting	Prototype Complete	Yes
Commerce	Economic Development Portal	In Process	Yes
DOR	Alien Worker Non Filer	Planning	Yes
ESC	Employment Statistics	In Process	Yes
Treasurer	Unclaimed Property	Complete	No
Auditor	Audit Data Mart	Planning	Yes

7.2.1. Impact of BEACON

The BEACON project will replace the current HR and central payroll systems of the State. If these systems are data sources for any of the current SAS initiatives then these will require modification to use the SAP suite of products as the source of data. Similarly, when the NCAS system is migrated to ERP 2005 financials in the future, the source of data for the SAS applications will need to be updated.

8. DISTRIBUTION OF REPORTS

The SAP BI Suite, - Business Explorer (BEx) - provides flexible reporting and analysis tools for strategic analyses and decision-making support within a business. These tools include query, reporting, and analysis functions. As an employee with access authorization, you can evaluate past or current data at various levels of detail and from different perspectives, not only on the Web but also in the portal and in Microsoft Excel.

You can use BEx Information Broadcasting to distribute business intelligence content by e-mail, either as pre-calculated documents with historical data, or as links with live data. You can also publish this content in the portal (in Knowledge Management folders or collaboration rooms).

8.1. Distribution Methods

Access to SAP BI reports and analysis will primarily be provided through the SAP NetWeaver Portal. The Information Broadcasting functionality will be used for pre-calculation and distribution of soft copy reports. Printing of reports will be discouraged.

8.1.1. SAP NetWeaver Portal

You can integrate business content of the BI system into the SAP NetWeaver portal seamlessly. The portal enables you to access applications from other systems and sources, such as the Internet or intranet. Using one entry point, you can reach both structured and unstructured information. In addition to content from Knowledge Management, business data from data analysis is available to you from the Internet and from the Intranet.

The integration of BI content into the portal enables you to work more closely and more promptly with company colleagues when you need to do so. For example, this can help when you need to insert notes and comments for key figures and reports, run approval processes automatically, and in doing so, take part in decisions within a broad organizational context.

The provision of information is based on user roles in the company. As the role concept is used in the BI system, it is possible to carry out a simple integration of BI content into the portal. The users see the same BI role content in the portal.

Furthermore, you can also use the iView concept to integrate BI applications and integrate individual Web applications from BI as iViews in the Portal. You can then display and use them from a page in the portal, together with other iViews from the BI system or from other systems.

8.1.2. BEx Information Broadcasting

BEx Information Broadcasting allows you to pre-calculate BEx Web Applications, queries, and workbooks and to distribute them into the portal. Furthermore, you can generate online links to queries and Web applications and then publish them in the portal. The BEx Portfolio, based on Knowledge Management, forms the central entry point for access to business intelligence information in the portal.

8.1.3. Printing of Reports

Mass or Batch Printing of reports is strongly discouraged, and as such, batch jobs resulting in output being sent to a printer will be created on an approved basis only. All information that would otherwise be printed is available on-line within SAP BI or ERP 2005. Users are expected to conduct the majority of their analysis

within the application itself, rather than on paper. Reports can either be saved electronically, or re-executed in a repeatable manner at a later date (some reports/information is time dependant, and therefore should be saved rather than re-executed).

However, should the need arise users will have the ability to print locally, to any printer available to their workstation/laptop via the LPT1 or IP ports. Again, central printing (scheduled printing) is discouraged.

9. SAP BI SCOPE

SAP BI Business Content can be modified and adapted in order to meet an organization's unique reporting requirements. It enables a quick and cost-effective implementation by providing a model that can be used as a guideline during implementation. Furthermore, it contains a pre-configured set of role based and task-relevant information models utilizing the information the end users need to carry out their tasks.

The SAP BI scope for BEACON HR/PY will provide the business critical reports needed to support and analyze the core HR/PY business processes.

The following table summarizes the proposed scope of SAP BI as it relates to the BEACON project.

9.1. Proposed Standard Business Content

A high level review of the functional areas in scope for BEACON provides an initial list of all the available and relevant SAP delivered business content for the SAP BI solution. Experience suggests that the final implemented scope of BI will be a subset of the objects listed with a few key InfoProviders that will require some level of enhancements to meet the needs of the project.

Proposed Standard Business Content			
Functional Area	**DataStore Objects**	**InfoCubes**	**MultiProviders**
Payroll	0PY_PP_C1: Auditing Information and Payroll Data 0PY_PP_C2: Posting Documents 0PY_PP_C3: Posting Documents and Auditing Information Combined	0PY_C02: Employee-Specific Payroll Data 0PY_PP2: Posting Documents 0PY_PPC01: Auditing Information on Postings Relevant to Cost Accounting	0PY_MC02: HR MultiCube (Time and Payroll Data)
Time Management		0PT_C01: Time and Labor	
Training & Event Management		0PE_C01: Training and Event Management	
Personnel Development		0PAPD_C01: Qualifications 0PAPD_C02: Appraisals	

Proposed Standard Business Content			
Functional Area	**DataStore Objects**	**InfoCubes**	**MultiProviders**
Personnel Administration	0PA_DS04: Employee - Education	0PAPA_C02: Headcount 0PA_C01: Headcount and Personnel Actions	
Organizational Management	0PA_DS02: HR Structural Authorizations – Values 0PA_DS03: HR Structural Authorizations – Hierarchy	0PAOS_C01: Staffing Assignments	
Personal Cost Planning and Simulation		0PACP_C01: Personnel Cost Plans 0PACP_C02: Planned Personnel Costs Per Cost Object	0PAC_MC01: Plan / Actual Comparison of Personnel Costs
Compensation Management		0PACM_C01: Compensation Analyses 0PACM_C02: Adjustments 0PACM_C05: Personnel Cost Planning	
Benefits		0PABN_C01: Benefits	
Cross Application Time Sheet		0CATS_C01: Time Sheet (Approved) 0CATS_C02: Time Sheet (For Approval)	0CATS_MC1: Time Sheet (Total)
Financials		0COOM_C02: Costs and Allocations (Delta Extraction)	

9.2. Proposed Custom Content

Preliminary discussions with the functional team have raised the possibility that some limited custom InfoProviders may be required to support additional Time Management reporting. At this stage it is too early to determine the criticality of the requirement and therefore whether this needs to be considered as an additional activity in the project.

Proposed Custom Content			
Functional Area	**DataStore Objects**	**InfoProviders**	**MultiProviders**

Proposed Custom Content			
Functional Area	**DataStore Objects**	**InfoProviders**	**MultiProviders**
Time Management	ZPT_DS51: Clock In / Out Detail ZPT_DS53: Quota Time Data Detail from 0HR_PT_03	ZPT_C51: Clock In / Out Analysis ZPT_C53: Quota Time Data from 0HR_PT_03	
Financials	ZFISL_O51: Special Ledger Details	ZFISL_C51: Special Ledger Analysis	

10. CONCLUSION

The reporting strategy and guidelines presented within this document are focused on the factors that drive successful data warehouse and SAP implementations. The recommendations consider the best mechanism to fulfill the reporting requirements, while balancing system-performance, support organization requirements, long-term data consistency, and the viability and robustness of the reporting toolset.

The BI Team will analyze the business reporting requirements and compare and contrast the available toolsets for report development (ERP 2005 and SAP BI) in order to determine the most appropriate vehicle to deliver that report. In the event that the most appropriate reporting vehicle lies outside of SAP BI, then the BI team will coordinate with the Functional Team(s) and IT to ensure that any gaps in functionality are clearly addressed.

Although it might not be a perfectly achievable goal, to the extent possible, BEACON would like to strive for a ‘paperless’ environment.

11. TOOLSETS AVAILABLE

The following documents toolsets reviewed by the BEACON team.

11.1. Standard ERP 2005 Reports

11.1.1. ABAP List Viewer (ALV)

SAP transaction lists are available within each module. The SAP List Viewer provides the functionality of defining these tabular list layouts. Within this list, the transactions have sort functionality, summation, and export to Excel features.

Advantages

- Up-to-the-minute
- Very efficient for narrow view of transactions and master data
- Lists of documents to work on
- Can drill down to transaction
- No development required, only minor configuration for layout options.

Disadvantages

- Requires additional indexes for selection criteria
- Based on the 'foundation' document tables
- Some configuration requires technical (i.e. ABAP) expertise.

11.2. Custom Developed ERP 2005 Reports

11.2.1. Logistics Information System (LIS)

Up to the minute info. Can be very efficient. Use this to see one transaction at a time, or transactions grouped for operations (ie. Pick lists left to pick, on time shipments this morning, shipments left to ship today).

Advantages

- Up-to-the-minute
- Very efficient for narrow operational view
- Light summaries and pivots can be created and saved
- Built with standard SAP configuration.

Disadvantages

- "Twinkling" database - ever changing
- Performance hit on the ERP 2005 system, especially if large number of users
- Archived data not available
- Not best for lists or drill down.

11.2.2. Report Painter and Report Writer

Primarily for reporting LIS, Financial, Cost Center Accounting (CCA), Profit Center Accounting (PCA), and Controlling-Profitability Analysis (CoPA) module.

Advantages

- Easy to use graphical tool
- User can define columns
- Easier than ABAP/4.

Disadvantages

- Not for casual user
- Need knowledge of SAP tables
- Not for ad hoc reporting
- Performance hit on the online ERP 2005 system
- Archived data not available
- Most documents/subjects span more than one base table
- Not available in all modules.

11.2.3. ABAP Query

Component based query tool provides a structured framework for custom report definition. Infosets defined by IT provide user community with a tool for ad hoc reporting or query definition against joined tables.

Advantages

- GUI interface allows multiple report/query layouts based on a single 'infoset' definition
- IT control over technical components of query execution, while end users control layout and display
- Report output easily exported to Excel, downloaded, or available to SAP BI's Business Explorer (via Remote Cube).

Disadvantages

- Limited capability to define the data retrieval within the infoset
- Infoset definition requires extensive ABAP and ERP 2005 knowledge
- Authorizations within ABAP Query require additional development and assignment (on top of the authorization objects used to control the rest of ERP 2005 transactions).

11.2.4. ABAP Code

For customizing standard reports or development of totally new, custom reports.

Advantages

- Ultimate flexibility for report data retrieval and output.

Disadvantages

- Requires experienced developer
- Export to other tools (outside the basic SAP list) requires further development

- Changes and modifications require additional developer involvement.

11.3. SAP BI Reports

11.3.1. Query Designer (formerly Business Explorer, BEx)

The Query Designer defines single queries that can be grouped into Excel workbooks or displayed individually in Excel or Internet Explorer. This is an evolution of the Business Explorer Tool provided in SAP BI 2.x releases.

Advantages

- Users can define their own queries and workbooks with minimal training
- Navigation within the query and drilldown are available
- Reports are automatically web-enabled, or executable in an Excel spreadsheet
- Multiple or single queries can be published within a single workbook for non-power user dissemination.

Disadvantages

- Requires a small learning curve for full proficiency
- Printed output is poor.

11.3.2. Web Application Designer

Advantages

- Allows web page development based on pre-defined BEx queries
- Full capability to present graphics based on query data
- Ability to schedule, cache, and download web reports after hours.

Disadvantages

- Designed for development by a trained 'web master' or portal manager (not highly technical, but not a freeform tool for end users)
- Printing and output of static report data is poor.

11.3.3. Crystal Reports (Third Party Tool)

Advantages

- Tightly integrated within SAP BI
- Graphics based report definition gives end users the ability to create/modify queries.
- Excellent print capabilities
- Ability to schedule and cache report retrieval during after hours.

Disadvantages

- Authorization and personalization outside the SAP configuration.

11.4. Toolset Summary

System	Reporting Tool	Recommendation	Reasoning	Team(s) Effected	End-user Role	Developer/IT Role
SAP BI	Query Designer (formerly known as BEx)	Primary reporting tool for SAP BI.	Standard SAP BI.	BI	Query and Workbook execution and analysis	Infoprovider development. Back-end SAP BI configuration.
	Web Application Designer	Primary reporting tool for web reporting.	Standard SAP BI.	BI	Web page access, report execution and analysis.	Infoprovider development. Back-end SAP BI configuration.
ERP 2005	Ad hoc Query	Used by HR, Standard SAP tool, commonly used by most HR implementations for ad hoc analysis of data in a tabular format.	SAP has provided this functionality out-of-the-box.	HR	Although not intended for end-user execution, a few may be developed and added to the Reporting Tree, thereby making them available for end-user access and execution	Report Design
	ABAP List Viewer	Implemented in ERP 2005 wherever available. This allows for dynamic manipulation of the information being presented. (Spreadsheet-like functionality: hide columns and or/rows, reorder columns, introduce sub-totals, filters, etc.)	Primary tool for delivering standard SAP list reports. Used in conjunction with custom ABAP code.	All Functional Teams, Development Team	Report execution. Transparently provides enhanced features and functionality (spreadsheet-like)	Display Variant definition. Field enhancements. Insertion of standard function modules into custom code.

	Logistics Information System * (LIS)	Discouraged. Only used for real-time reporting requirements with appropriate business justification. MM-Inventory Controlling is the exception to this.	Not-real-time,, aggregated reporting, which is better suited for SAP BI.	Supply Chain, Development	Report execution	Configure and set-up where required.
	Report Painter and Report Writer	Discouraged. Only used for real-time reporting requirements. If a report is required, then BEACON has taken the position that we'd rather develop this in ABAP code, as that way we can optimize the performance, and have more control over the format and output.	The features and functionality of SAP BI are superior to those within Report Painter and Report Writer.	All functional Teams, Development Team	Report execution.	Report definition. Report tree maintenance.
	ABAP Query	Report development tool used at the BEACON team's discretion. Typically, these reports are 'written' by functional teams without having to involve a developer, and serve only to support Cut-Over activities, such as Data Validation Exercises.	Query tool has better SAP BI integration than ABAP code, and has a shorter development time. ABAP Query Development can result in non-optimized table joins, and therefore are not suited for repetitive (end-user) execution.	Functional Teams, Development Team	Not available for end-users.	Infoset definition. Report Design and Build. Report Tree maintenance.
	ABAP Code	Used as a last resort for reporting requirements not met by either SAP BI or standard SAP ERP 2005 reports, but used instead of Report Writer, Report Painter, ABAP Query for most ERP 2005-based Reports.	Limited capacity to design and develop and support significant numbers of custom reports.	Development	Report execution.	Coding and development.

*** The Logistics Information System includes the Sales Information System (SIS), Purchasing Information System (PURCHIS), Inventory Controlling, Shop Floor Information System (SFIS), Plant Maintenance Information System (PMIS), and Quality Management Information System (QMIS).**